

***Conservation Assessment
For
Bristly Cave Crayfish (*Cambarus setosus*)***



(From Pflieger, 1996)

USDA Forest Service, Eastern Region

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This Conservation Assessment was prepared to compile the published and unpublished information on Cambarus setosus. It does not represent a management decision by the U.S. Forest Service. Though the best scientific information available was used and subject experts were consulted in preparation of this document, it is expected that new information will arise. In the spirit of continuous learning and adaptive management, if you have information that will assist in conserving the subject community and associated taxa, please contact the Eastern Region of the Forest Service Threatened and Endangered Species Program at 310 Wisconsin Avenue, Milwaukee, Wisconsin 53203.

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EXECUTIVE SUMMARY

The Bristly cave crayfish is designated as a Regional Forester Sensitive Species on the Mark Twain National Forest in the Eastern Region of the Forest Service. The purpose of this document is to provide the background information necessary to prepare a Conservation Strategy, which will include management actions to conserve the species.

The Bristly cave crayfish is an obligate cavernicole that occurs in subterranean habitats in the Springfield Plain of southwestern Missouri and adjacent Arkansas and Oklahoma. It has been reported from over 25 localities and there are several unpublished records.

NOMENCLATURE AND TAXONOMY

Classification: Class Crustacea
Order Decapoda
Family Cambaridae

Scientific name: Cambarus setosus

Common name: Bristly cave crayfish

Synonyms: Cambarus ayersii
Cambarus ayersi

This species was described by Faxon (1889) and subsequently listed in many checklists, keys, etc. (complete list of citations in Hobbs and Barr, 1960; Hobbs, et al. 1977). The species was redescribed by Hobbs and Barr (1960). Cambarus ayersii, described from Fishers Cave by Steele (1902), was synonymized by Hobbs and Barr (1960).

DESCRIPTION OF SPECIES

The Bristly cave crayfish is an unpigmented, white crayfish with small, unpigmented eyes and long pincers. The species attains a size in excess of 110 mm. In life this crayfish is nearly white, with the internal structures visible through the translucent exoskeleton (Pflieger, 1996). Identification of this species with certainty requires a specialist familiar with the taxonomy of crayfish.

Figure 1. *Distribution of the Bristly cave crayfish (from Pflieger, 1996)*



LIFE HISTORY

Pflieger (1996) reported that form I males (reproductively mature) specimens have been collected in all seasons and mating has been observed in June. A female with eggs has also been found in June; a juvenile about 10 millimeters in length was noted in December. The usual life span of crayfish in Missouri is one to three years, although the subterranean species may live considerably longer (Pflieger, 1996).

HABITAT

Cambarus setosus is an obligate inhabitant of subterranean waters. Hobbs and Barr (1960) reported the crayfish from caves, springs and a well. Gardner (1986) noted that a large population occurred in Turnback Cave, where the stream is enriched by bat guano. Otherwise the stream in the cave varied from less than a meter to two meters in depth, flowing over sandy, muddy substrate with scattered breakdown. Most of the records of this species are from the dark zone of caves, although it has also been collected from the twilight zone of caves, the outflow of springs and wells exposed to light (Pflieger, 1996).

DISTRIBUTION AND ABUNDANCE

This species is known only from the Springfield Plateau section of the Ozarks in southwestern Missouri and extreme northeastern Oklahoma. In Missouri it was reported by Pflieger (1996) from 25 localities in a nine county area in the drainages of three major streams: Neosho (Elk and Spring), White and Missouri (Osage). New localities reported by Marquart (1979) were largely sight records.

RANGEWIDE STATUS

Global Rank: G2/G3 imperiled/vulnerable; The global rank of G2 is assigned for species that are known from 6-20 localities; G3 for species known from 21-100 sites. Pflieger (1996) reported this species from 25 collection sites, and two unconfirmed localities in northeastern Oklahoma were suggested by Hobbs, et al. (1977). Elliott (personal communication, 2002) reported that additional sites for the species in northwestern Arkansas have been found by The Nature Conservancy's cave bioinventory of Arkansas. Although the number of sites from which this species is known would place it as a G3, considering the restricted habitat, apparent low fecundity, and perceived decline (Gardner, 1986) of Cambarus setosus the rank of G2 is suggested.

Missouri State Rank: S2/S3 imperiled/vulnerable; The state rank of S2 is assigned for species that are known from 6-20 localities; S3 for species known from 21-100 sites. Pflieger (1996) reported 25 sites on his range map of Missouri. However, the state rank of S2 is suggested due to the reasons given above. Cambarus setosus is a state endangered species in Missouri (Elliott, personal communication 2002).

POPULATION BIOLOGY AND VIABILITY

Pflieger (1996) reported that little was known of the feeding specifics of Cambarus setosus or any of the other Missouri crayfish. However, crayfish in general are considered omnivores, feeding on a wide variety of plant and animal material. Gardner (1986) noted that the crayfish has declined due to habitat degradation caused by expanding urbanization of its range, resulting in groundwater pollution. Marquart (1979) reported that the species was feared extirpated from Fishers Cave due to pollution from a sewage substation in Springfield, Missouri.

POTENTIAL THREATS

Since Cambarus setosus only occurs in the Springfield Plateau in southwestern Missouri and none of the known localities is in the Mark Twain National Forest, there is little that the forest service can do to insure the viability of this species. The primary threats to this species are from urban development in the Springfield and Branson areas.

SUMMARY OF LAND OWNERSHIP AND EXISTING HABITAT PROTECTION

None of the localities cited by Hobbs, et al. (1977), Gardner (1986) or Pflieger (1996) for Cambarus setosus are owned by the Mark Twain National Forest. This species is not known to occur in the Mark Twain National Forest (Elliott, personal communication 2002).

SUMMARY OF MANAGEMENT AND CONSERVATION ACTIVITIES

New localities for this species have been found in The Nature Conservancy's bioinventory of Arkansas caves. Form I voucher specimens have been taken from selected sites in Missouri by Dr. William Elliott.

RESEARCH AND MONITORING

Active bioinventories are being conducted in caves in Missouri by the Cave Research Foundation and in Arkansas by The Nature Conservancy. An active monitoring program of caves and cavernicoles is being conducted in Missouri by the Missouri Department of Conservation.

RECOMMENDATIONS

Cambarus setosus does not occur in the Mark Twain National Forest and consideration should be given to removing it from the list of Regional Forester Sensitive Species.

REFERENCES

- Faxon, Walter. 1889. Cambarus setosus. Page 237 (plates 1 and 2) in Harrison Garman, Cave animals in southwestern Missouri. Bulletin of the Museum of Comparative Zoology, 17: 225-239.
- Gardner, J.E. 1986. Invertebrate fauna from Missouri caves and springs. Missouri Department of Conservation, Natural History Series 3, 72 pages.
- Hobbs Jr., H.H. 1952. A new albinistic crayfish of the genus Cambarus from southern Missouri with a key to the albinistic species of the genus (Decapoda, Astacidae). American Midland Naturalist, 48 (3): 689-693.
- Hobbs, Jr., H.H. and Thomas C. Barr, Jr. 1960. The origins and affinities of the troglobitic crayfishes of North America (Decapoda, Astacidae). I. The genus Cambarus. American Midland Naturalist, 64 (1): 12-33.

- Hobbs, Jr., H.H., Hobbs III, H.H., and M.A. Daniel. 1977. A review of the troglobitic decapod crustaceans of the Americas. *Smithsonian Contributions to Zoology*, 244: 1-183.
- Marquart, D. 1979. Troglobitic crayfish of Missouri. Master's Thesis, Central Missouri State University, Warrensburg, 39 pages.
- Pflieger, William L. 1996. The crayfishes of Missouri. Missouri Department of Conservation, 152 pages.
- Steele, Mary I. 1902. Crayfish of Missouri. *Publications of the University of Cincinnati*, series 2, 2 (10): 1-53.